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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,369	11/18/2003	Jongsang Lee	5853-464	6670

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EXAMINER
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MOORE, MARGARET G

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 04/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/716,369

Applicant(s)

LEE ET AL.

Examiner

Margaret G. Moore

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 to 17 is/are pending in the application.
- 4a) Of the above claim(s) 11 to 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 to 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1 to 10, drawn to a method and a ceramic made thereby, classified in class 528, subclass 38.
  - II. Claims 11 to 13, drawn to a polymer, classified in class 528, subclass 38.
  - III. Claims 14 and 15 drawn to a partially pyrolyzed polymer, classified in class 528, subclass 38.
  - IV. Claim 16, drawn to a rod assembly, classified in class 376, subclass 347.
  - V. Claim 17, drawn to a spent fuel container, classified in class 588, subclass 1+.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions of Group I and Group II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a materially different method, such as a method in which boroxine is reacted rather than a boron halide, or a method in which no halosilane is included or a method in which  $R_3SiNH_2$  is a reactant rather than a disilazane.
3. Inventions of Group I and Group III are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product can be made by a materially different process, such as a process in which one of the methods noted in paragraph 2, supra, as an alternative for making the preceramic polymer, is performed as a means of preparing a preceramic polymer.

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4. Inventions of Groups I and IV and V are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a coating composition or in the preparation of insulation, belting, gaskets or curtains and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Neil Jetter on April 4, 2005, a provisional election was made with traverse to prosecute the invention of Group I, claims 1 to 10. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11 to 17 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

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8. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "substantially amorphous" is a subject description that does not appear to be defined by the specification. The Examiner is unable to determine the breadth of this term and thus the metes and bounds of this claim limitation cannot be determined.

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1-4, 6, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Bujalski et al.

Bujalski et al. teach methods of making silicon carbide fibers from borosilazanes. See for instance Example 3 in which a disilazane meeting claim 2, a halosilane meeting claim 3 and boron trichloride meeting claim 3 are reacted at 190°C to form a polymer. This meets the requirements of claims 1 to 3. This "exclusively by said reacting step" limitation in claim 4 is met by Bujalski et al. since the "reacting step" is open to adding the reactants at different times and carrying out the reaction at different temperatures. As shown on column 8, lines 56 and 57, this polymer is subsequently pyrolyzed to form a ceramic at temperatures of 1200 and 1800°C, meeting claims 9 and 10.

For claim 6, the prior art is silent as to an amorphous property, through it does teach that the final ceramic is substantially crystalline. Note that it is unclear what weight

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to give the term "substantially amorphous". Similarly, for claim 5, the prior art is silent as to the chlorine content of the final polymer. The prior prepares a preceramic polymer or oligomer by the same process as claimed. Since the process by which the product is prepared will directly affect the properties of the polymer the resulting properties associated with the polymer or oligomer prepared by the claimed method must inherently be present in the prior art polymer or oligomer as well.

12. Claims 5, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bujalski et al.

On the other hand, regarding claim 5, if the chlorine content requirement is not inherently met by Bujalski et al, it would have been prima facie obvious. Purer forms of known products may be patentable, but the mere purity of a product, by itself, does not render the product unobvious. *Ex parte Gray*, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). Factors to be considered in determining whether a purified form of an old product is obvious over the prior art include whether the claimed chemical compound or composition has the same utility as closely related materials in the prior art (as they do in the instant application) and whether the prior art suggests the particular form or structure of the claimed material or suitable methods of obtaining that form or structure (which method of obtaining the claimed form is consistent with that in the prior art). In view of these factors and the fact that it has been held that impure products are prima facie obvious over the prior art, this claim is rendered obvious.

For claims 7 and 8, note the teachings on column 4, line 32, which teach curing the fibers in Bujalski et al. at a temperature of up about 400°C prior to pyrolyzing. This range renders obvious the range of at least 300°C since patentees upper limit is within the range claimed. Also note that "about 400" overlaps with the lower claimed limit of 400 and as such renders obvious temperatures meeting the claimed range. Note that the term "about" in the prior art embraces temperatures slightly above and below 400.

With regard to the wt% hydrogen limitation, note the bottom of column 3 through column 4 which details the borosilazane. Note that the polymers should have SiH groups for faster cure rates. Also note that the process in Bujalski et al. overlaps with


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the claimed process. It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (i.e. does not require undue experimentation).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Margaret G. Moore whose telephone number is 571-272-1090. The examiner can normally be reached on Monday to Wednesday and Friday, 10am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Margaret G. Moore  
Primary Examiner  
Art Unit 1712

mgm  
4/10/05